The Development of an Interactive Science Literacy Model Based on Folk Stories for Chinese Children Using Dialogic Reading Techniques

Romarzila Omar[1,*], Lina Busyra Safwan[1], Ruslan Abdullah[2], Hazhari Ismail[1], Seah Siok Peh[1], Nur Ain Farhana Kariuddin[1] & Adibah Abu Bakar[3]

[1]Early Childhood Department, Faculty of Human Development, University Pendidikan Sultan Idris, 35900, Tanjong Malim, Perak, Malaysia

[2]Teacher's Training Institute, Malay Language Campus, Ministry of Education, 59100, Kuala Lumpur, Malaysia

[3]Biology Department, Faculty of Science and Mathematics, University Pendidikan Sultan Idris, 35900, Tanjong Malim, Perak, Malaysia

*Correspondence: Early Childhood Department, Faculty of Human Development, University Pendidikan Sultan Idris, 35900, Tanjong Malim, Perak, Malaysia. E-mail: romarzila@fpm.upsi.edu.my

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Abstract

This research was conducted to analyze the needs of the Interactive Science Literacy Model based on Chinese children's folktales using dialog reading techniques among preschool students. This study uses a design and development research (DDR) approach. The data analysis technique used in this study is qualitative and quantitative data analysis. The research respondents for phase one were qualitative, consisting of 9 teachers from Chinese preschool and data for quantitative consisting 89 teachers from Chinese preschool. This study uses document analysis instruments, interview protocols and questionnaire. The research objective for this study is to analyze the needs of an Interactive Model of Science Literacy based on Chinese children's folktales using dialogic reading techniques among Chinese preschool students. Atlas. t.i version 4.1 software is used for analyzing interview transcriptions, developing themes, categories and subcategories and SPSS version 22 software is used for analyzing questionnaire. The researcher has analyzed content validity and reliability on the interview protocol instrument and questionnaire using Cohen's kappa index. For questionnaire, two of the three experts showed a kappa value of 1.0 and it shows a very good interpretation. An expert has given a kappa value of 0.96 and the interpretation is also very good. Next, for interview protocol, the kappa value after being assessed by experts are two of the three experts showed a kappa value of 1.0 and it also shows a very good interpretation. The results of need analysis show that Chinese preschool teachers give a positive response and really need a Science Literacy model to help and support them in teaching. One of recommendations for the development of the model when teachers and students will switch roles while reading using this dialogic reading technique so that children can learn to be storytellers with the assistance of adults who act as active listeners and questioners.

Keywords: interactive model, science literacy, Chinese children's folktales, dialogic reading, Chinese preschool and Atlas/ti version 4.1

1. Introduction

Children are born to explore and learn about their surroundings. According to Bodil, S., Sofie (2018), children should be encouraged to distinguish, explore, document, ask questions, and talk about science. Preschool teachers should therefore plan lessons that will improve children's conversation about science and logical thinking. Children need help from those around them at school, especially teachers, to improve their ability to interact and read in science literacy. This point is supported by Åkerblom & Thorshag (2021) assertion that preschool children should be encouraged to discuss, ask questions, and investigate scientific phenomena and technological processes.

Science Literacy is a component of the National Preschool Standard Curriculum's Science and Technology Pillar (KSPK, 2017). The Preschool Standard Curriculum is designed with an emphasis on content standards and learning standards that preschool students understand and master. Language and Communication pillar, Science and

Technology pillar, Physical Development and Aesthetics pillar, Spirituality, Attitude and Values pillar, Personal Skills pillar, and Humanity pillar are the six pillars of KSPK. Pillars of Science and Technology include scientific knowledge, skills, and attitudes, as well as mathematical knowledge and skills. Early development of reading skills in students, particularly in preschool classes, is critical because these skills will serve as the foundation for their mastery of Science Literacy. Literacy is defined as children's ability to read, see, write, design, speak, and listen in a way that allows them to effectively communicate with their parents, friends, and others (Nordin & Romarzila, 2022).

An interactive teaching method can pique students' interest in learning and reading. Delivery techniques are heavily emphasized in order to ensure that students develop understanding and mastery of the language as well as the desired achievement at the highest level (Aishah Abdul Malek et al., 2019). The use of teaching aids is an important method in determining the level of student memory (Salsidu at al., 2018). As a result, in order to improve preschool children's reading mastery of Science Literacy, particularly at SJKC preschool, the researcher will create an interactive Science Literacy model. This is due to the fact that the level of language proficiency among students of various ethnicities, particularly Chinese students, has not yet met their expectations in the Malay language (Nur Hijrah Zakaria et al., 2019).

Students, as we all know, enjoy both listening to and telling stories. If the learning materials used are interesting to the students, they will learn quickly and remember what they have learned. Students will be motivated to learn as a result of the story. Among the benefits of storytelling, in addition to learning to express words, are facial expression skills, body language expression, voice intonation, storytelling tools, and creative movement (Rahman et al., 2021). In this study, the researcher will use dialogic reading techniques to create an interactive model based on Chinese children's folktales. Folklore is a society's culture that can open children's minds and allow them to think more openly and creatively. Furthermore, folklore is a story passed down from generation to generation (Omar et al., 2019).

Whitehurst and colleagues created a dialogic reading approach (Dialogic reading) based on the Vygotskian model (1978) to help children learn in a social setting (Whitehurst et al., 1988). The practice of reading interactive picture books to children to improve their language and literacy skills is known as dialogic reading. Adults and children will switch roles during dialogic reading until the child learns to be the storyteller with the assistance of adults who serve as active listeners and questioners. Researchers will create an interactive model of language literacy based on folktales and use dialogic reading techniques to improve the reading skills of Chinese preschool children in Science Literacy.

2. Problem Statement

Understanding the concept of Science is critical in teacher education. Based on an inspection conducted by the Malaysian Ministry of Education in 2012 and 2013, the report discovered that a large number of preschool teachers are having difficulty understanding the content of the preschool curriculum, particularly for preschool teachers who are not optional. Leigh K. Smith et al. (2022) argue in their study that teachers have an inaccurate or limited understanding of Science concepts, which causes them to be less confident in their ability to teach Science. To improve student understanding, preschool teachers should make thorough preparations before beginning to teach Science to preschool students. This is due to the fact that teachers who lack teaching knowledge are unable to carry out the instructions and actions that must be taken in the event of an extraordinary and amazing situation (Duran et al., 2021).

From another perspective, a lack of teaching and learning materials limits activities in science learning (Julia Barenthien & Dunekacke, 2021). According to Fuadi et al. (2020), the choice of learning resources is a factor in the low ability of Science Literacy. The choice of learning resources is critical for improving students' mastery of Science Literacy. According to Shohib et al. (2021), one of the causes of students' low Science Literacy skills is the quality of books used in learning. Science literacy begins with asking good questions and being curious about the world around us (Christopher Moore, 2018). As a result, a lack of learning materials and the quality of book used by teachers affected teachers teaching in preschool.

This folk tale is ideal for use in Science Literacy instruction to increase students' motivation to learn Science Literacy. Grakhova (2019) believes that folklore has been successfully used in the teaching of reading modern literature as well as playing an important role in students' learning and reading activities because it has a close relationship with students' Literacy. According to Salimovna (2022), folk tales can shape students' thinking and imagination, allowing them to develop their speech, gain experience, design the outside world, and act on their ideas. This demonstrates that students will be able to express their ideas during the lesson by using folk stories. Furthermore, dialogic reading

techniques can help students develop their Science Literacy. Effective dialogic reading techniques, according to Bezuidenhout (2021), are an effective way to gradually develop students' vocabulary and concepts. Despite the fact that it has been used for a long time in other countries, this dialogic technique is still not widely used in Malaysian learning and teaching. Dialogic reading has had implications and made significant contributions to improving preschool children's language development, particularly in the area of reading skills. Next, Whitehurst and his colleagues demonstrated the effectiveness of dialogue reading techniques in improving literacy development for children aged 2 to 6 years in a study by Kim & Riley (2021). While reading a book, children can express their opinions to adults in their own sentences through dialogic reading.

Based on the problem statement discussed, the researcher feels it is appropriate to develop a Science Literacy teaching model to help preschool students who have problems in Science Literacy. The researchers hope that this study will be able to help practically to avoid continuous dropout among preschool students when they step into year one later.

3. Objective

This study was conducted to;

I. Analyze the needs of the Interactive Model of Science Literacy based on Chinese children's folktales using dialogic reading techniques among SJKC (Chinese National Type School) preschool students.

4. Methodology

This study is to develop an Interactive Model of Science Literacy based on Chinese children's folktales using dialogic reading techniques among SJKC preschool students using a design and development research (DDR) approach through mixed methods that are quantitative and qualitative. According to Jamil & Nurul (2021), the empirical basis for product production is a process in the production of design, development and systematic evaluation.

The DDR design phase is divided into three parts;

Phase 1: Analyze the needs of the Interactive Model of Science Literacy based on Chinese children's folktales using dialogic reading techniques among SJKC preschool students.

Phase 2: Developing an Interactive Model of Science Literacy based on Chinese children's folktales using dialogic reading techniques among SJKC preschool students.

Phase 3: Exploring the applicability of an interactive

Science Literacy Model based on Chinese children's folktales using dialogic reading techniques among SJKC preschool students.

In this article the researcher will emphasize on phase one only. The Needs Analysis phase is the first phase that will be implemented by the researcher. Kara, N., & Cagiltay, K. (2020) stated that the Needs Analysis Phase is a better starting point for conducting studies that use the DDR approach.

Guided by the Scriven Model, the researcher began by setting goals to be achieved in line with the purpose of model development, which is to build an Interactive Science Literacy model using Dialogic Techniques based on Chinese children's folktales. Scriven testing the value or benefits of the program is the purpose of evaluation (Wardani et al., 2022). Therefore, this model is used to see the effectiveness of the product or model that will be built by the researcher. According to Scriven, the evaluation function is a formative and summative function (Indah sari, 2021). According to Wardani et al. (2022), the evaluation function can be concluded that:

1) In terms of psychology, learning assessment is needed to know their learning achievements so that they feel satisfaction and peace in learning.

2) Socially is to find out if students are able to get involved in the community around them.

3) Can assist teachers in placing students to study according to their abilities and skills.

4) To know the position of students in the group.

5) To determine the readiness of students in taking their education program.

6) Knowing the students' potential so that the teacher can guide them according to their interests and talent.

Based on the evaluation function of the Scriven Model, the researcher has developed interview questions to find out

the Need Analysis of this study. The researcher has conducted an interview session on 9 SJKC preschool teachers to complete the needs analysis for this study. Atlas/ti version 4.1 software is used for analyzing interview transcriptions, developing themes, categories and subcategories. Through survey research in this phase, the researcher will obtain strong data to state that this model should continue to be developed based on the need for it.

Then, researcher has conducted a needs analysis involving 86 preschool teachers who teach in SJK(C) preschools in the state of Perak using a questionnaire instrument.

5. Validity and Reability

Validity and reliability is a process that determines each item construct in the instrument is appropriate and can answer each research question. Validity is used to measure the accuracy of a measure used in a study. According to Yaakub et al. (2020), the validity of an instrument is its ability to measure what should be measured and to allow the interpretation of the appropriate score. The purposes of instrument validity are defensibility, accuracy, appropriateness, meaningfulness, and usefulness.

While, reliability is a concept that refers to the consistency and stability of a measurement or measuring tool or study or questionnaire across time against an idea. Reliability aims to find out whether the measure gives the same answer when it is used to measure the same concept to the same population or sample or respondents. According to the results obtained through the use of specific instruments conform to the theory Osman & Hussin (2018) or concept used and are evaluated through the aspects of convergent validity and discriminant validity, reliability, and construct validity. In this study, the researcher has done content validity of the interview protocol instrument and questionnaire.

5.1 Cohen Kappa Index

Cohen's kappa index will be used to content validate and analyze the interview protocol instrument and questionnaire. The content validation will be performed by three experts. This group of experts will examine the Model activity's content and steps. The Kohen Kappa calculation technique will be used to process this data. Jacob Cohen published 'A Coefficient of Agreement for Nominal Scales' in 1960, which introduced the Cohen Kappa indexed analysis method. Cohen (1960) stated that the degree, relevance, and stability of the sample should be determined by two or more independent judges based on their agreement. The Cohen Kappa data analysis method was used in this study to determine the degree of agreement of expert reliability on the model produced by the researcher. The agreement value of the data is calculated based on the following formula:

$$K = \frac{fa - fc}{N - fc}$$

Where;

K – Kappa coefficient value

fa – frequency of agreement

fc – frequency of 50 percent expected agreement

N – number of units tested agreement value

Table 1. Kappa Value Table and Interpretation (Level)

Kappa Value	Interpretation
Kurang daripada 0	Very weak
0.00 – 0.20	Weak
0.21 – 0.40	Moderately weak
0.41 – 0.60	Medium
0.61 – 0.80	Good
0.81 – 1.00	Very good

Source: (Cohen, 1960; Merriam, 2009; Mokhtar, 2011 Othman et al., 2018)

Table 2. Expert Kappa Values for Interview Instruments

Expert	Kappa Value
Expert 1	0.8
Expert 2	1
Expert 3	1

Table 2 shows the kappa value after being assessed by experts. Two of the three experts showed a kappa value of 1.0 and it shows a very good interpretation.

Table 3. Expert Kappa Values for Questionnaire Instruments.

Expert	Kappa Value
Expert 1	1
Expert 2	0.96
Expert 3	1

Table 3 shows the kappa value after being assessed by experts. Two of the three experts showed a kappa value of 1.0 and it shows a very good interpretation. An expert has given a kappa value of 0.96 and the interpretation is also very good.

5.2 A Pilot Study

The researcher has conducted a pilot study on 25 SJKC preschool teachers. The questionnaire data and this pilot study were analyzed using SPSS 23 software in Cronbach's alpha.

A pilot study was conducted to obtain the Cronbach Alpha value for each item construct in this instrument before it was used in the actual study. The purpose is that each construct item in the instrument is useful and answers to each research question.

The questionnaire used in this study has analyzed using Cronbach Alpha in SPSS-23. Findings the questionnaire form of this study has been shown in Table 4 showing an overall Cronbach Alpha value of 0.960 for the pilot study and 0.925 for the actual study. The analysis of these findings has been shows that the Cronbach Alpha value of the instrument that used in this study is high where the Cronbach Alpha value is over 0.7 and the Cronbach Alpha difference value obtained between the pilot study and the actual study is as much as -0.035.

Table 4. Cronbach Alpha Value

Pilot study	Actual study
0.9.60	0.925

The reliability value of the instrument obtained is seen to be very good and effective with a high level of consistency. In this pilot study as well, the researcher has taken note of the lack of understanding of the instruments and suggestions from the study respondents.

6. Result

6.1 Document Analysis

Through a review of the National Preschool Standard Curriculum, it was discovered that it contains six pillars, namely the Language and Communication pillar, the Science and Technology pillar, the Physical and Aesthetic Development pillar, the Spiritual, Attitude and Values pillar, the Self-Skills pillar, and the Humanity pillar (KSPK, 2017). The National Preschool Standard Curriculum (KSPK) was also revised in 2017 to meet the Malaysian Education Development Plan (PPPM) 2013-2025's new policy and time requirements.

The National Preschool Standard Curriculum is designed with a focus on the content and learning standards that students must understand and master. These content and learning standards are developed by focusing on knowledge, fundamental skills, and values in the six pillars of KSPK, namely communication, spirituality, attitudes and values, humanity, science and technology, physical and aesthetic development, and personal skills. The pillar of Science and Technology is the one that is being researched in this study. Early reading skills in children, particularly in preschool

classes, are critical because these skills will serve as the foundation for their mastery.

6.2 Interview Protocol

In order to answer the research question which is the needs of the Interactive Model of Science Literacy based on Chinese children's folktales using dialogic reading techniques among SJKC preschool students, the researcher interviewed 9 SJKC preschool teachers. After that, the researcher has set several themes and subthemes using Atlas.TI software version 4.1. The themes that have been set are Science Literacy, Folklore, Dialogic Reading Techniques and Model Requirements.

6.2.1 Science Literacy

6.2.1.1 Teacher's Science Knowledge

Based on the interview questions, 6 out of 9 preschool teachers seem to understand the meaning of science literacy. However, there are three preschool teachers who do not really understand science literacy. When asked why, they stated that they were not actually preschool option teachers. Among the content of the interview that falls under the sub-theme of the teacher's understanding of science are activities related to science, hands-on activities, student inquiry about the natural world, students' ability to use science knowledge, applying science, solving problems creatively, being able to communicate better, support technology and science in early childhood education, prioritizing for students to understand the basic concepts of science, students' ability to manage information and knowledge about science, knowledge related to nature and the world of physics and student's ability to understand and analyze information about nature and the world of physics and then apply it in everyday life. Figure 1 shows the first sub-theme of Science Literacy which is the teacher's science knowledge.

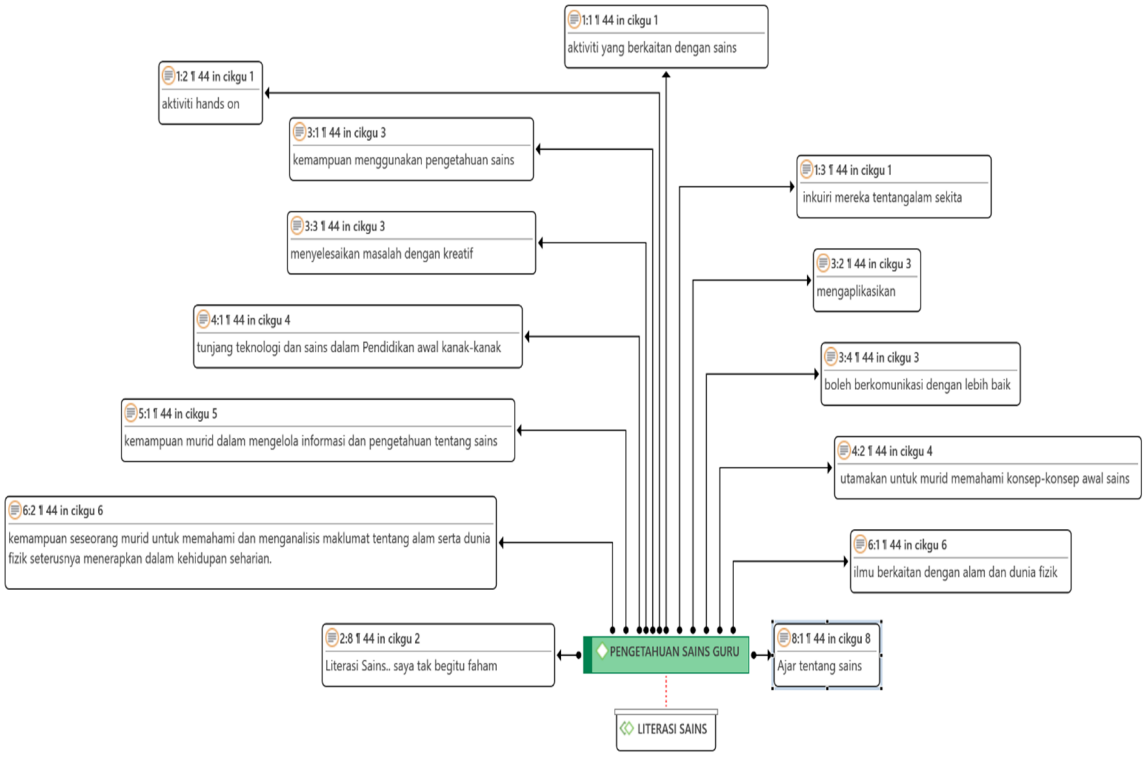

Figure 1. Teacher's Science Knowledge

6.2.1.2 Teaching Constraints

Based on an interview with a SJKC preschool teacher, the constraints in teaching Science Literacy are the need to provide more hands-on materials, less existing materials, no suitable references for teaching this science, no suitable modules and story books, students' understanding is not connected to the aspect of science again, teachers need to explain more so that students can relate that in life there is an element of science, time constraints during the Science literacy *(PdPc)* process cause the activities carried out to need to be accelerated, teaching aids are not enough, the

language used to teach is the main problem and lastly students do not have much experience and do not know much about the outside world. Figure 2 shows the sub-theme of Science Literacy which is teaching constraints.

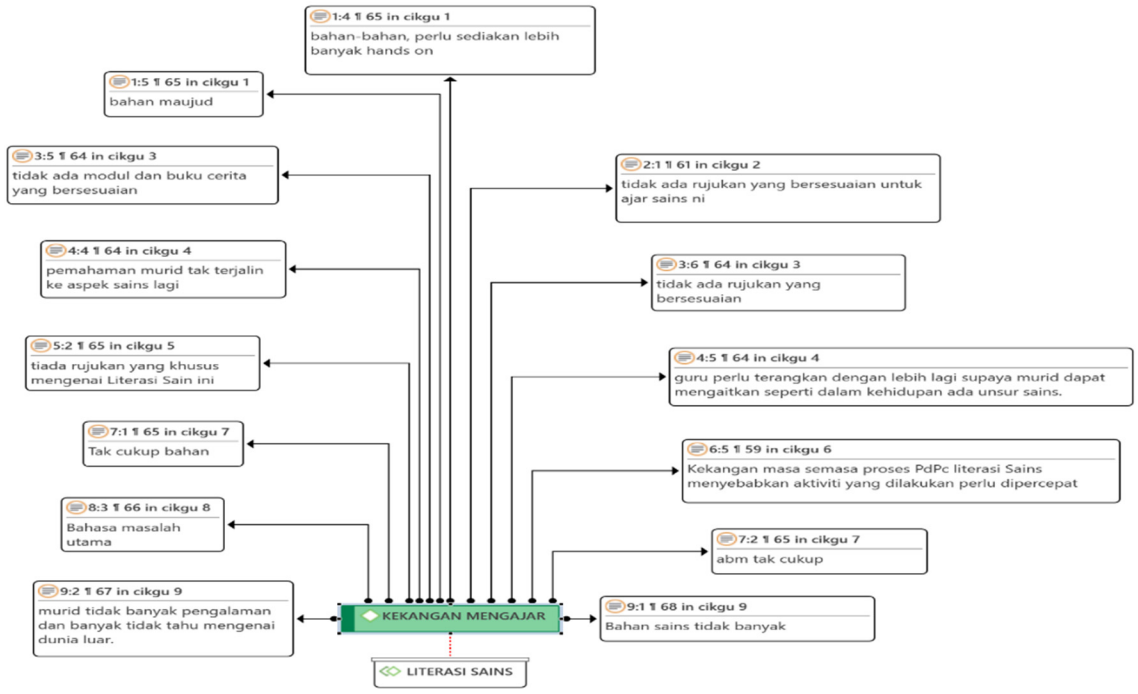

Figure 2. Teaching Constraints

6.2.1.3 Teacher Reference

Based on the interview questions, the teacher's reference for teaching Science Literacy is the KSPK Curriculum, STEM module, inquiry model and learning approach contained in the KSPK Preschool Standard Curriculum. This point shows that the primary reference for preschool teachers is KSPK and there is still no specific teaching model on Science Literacy that teachers can refer to. Figure 3 shows the sub-theme of Science Literacy which is teacher reference.

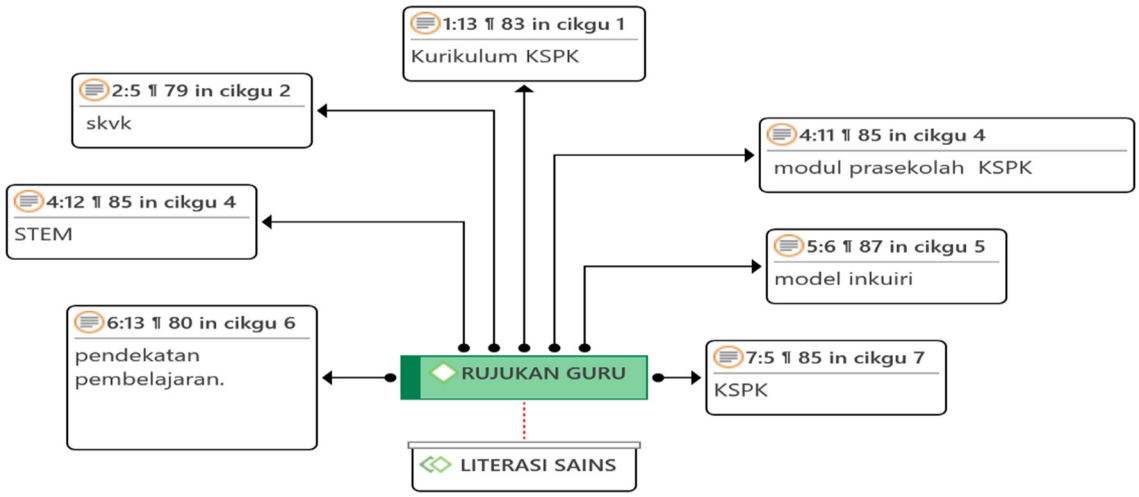

Figure 3. Teacher Reference

6.2.1.4 Teaching Methods

Next, the teaching methods used by teachers when teaching Science Literacy are experiments, video screenings, story telling, project approaches, using the 4E technique, using slides, using smart TV and using materials available in the student's environment. Based on this interview, it shows that only one teacher is used to using stories to teach Science Literacy. This shows that the teaching model that will be produced is very necessary in the teaching of teachers. Figure 4 shows the sub-theme of Science Literacy which is teaching methods.

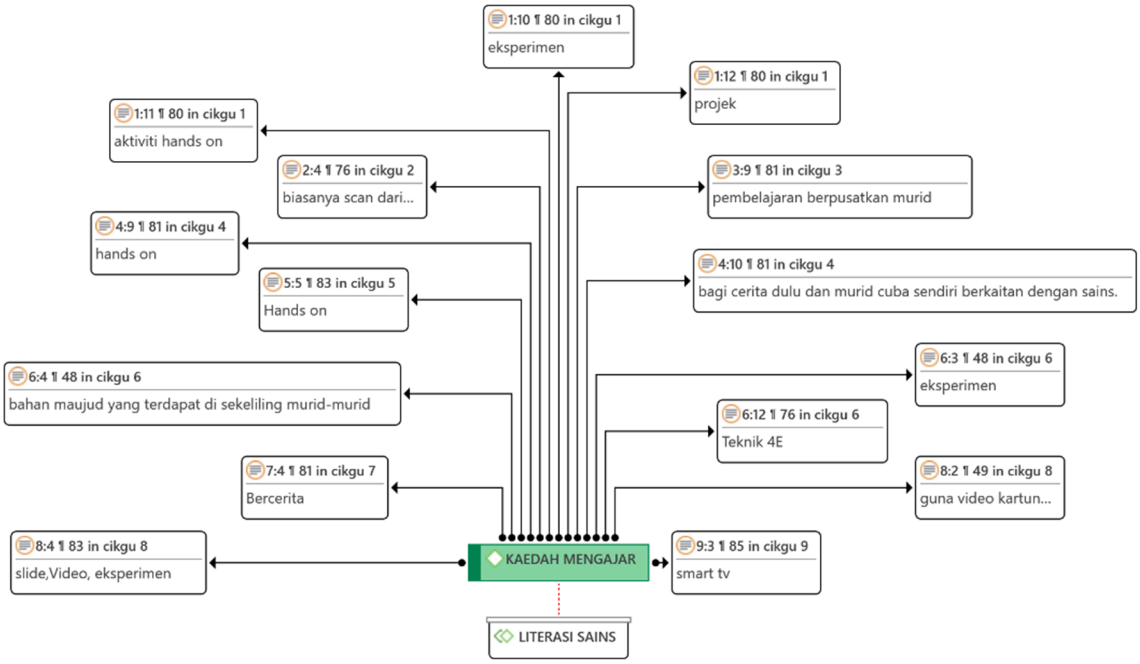

Figure 4. Teaching Methods

6.2.2 Folklore

6.2.2.1 Suitable for Students

The sub-themes in folk tales are suitable for students. The content of the sub-theme suitable for students is to teach stories that students do not know, select appropriate stories and filter the stories, choose an interesting story and folklore that has good value. Figure 5 shows the first subtheme of Folklore which is compatibility with students.

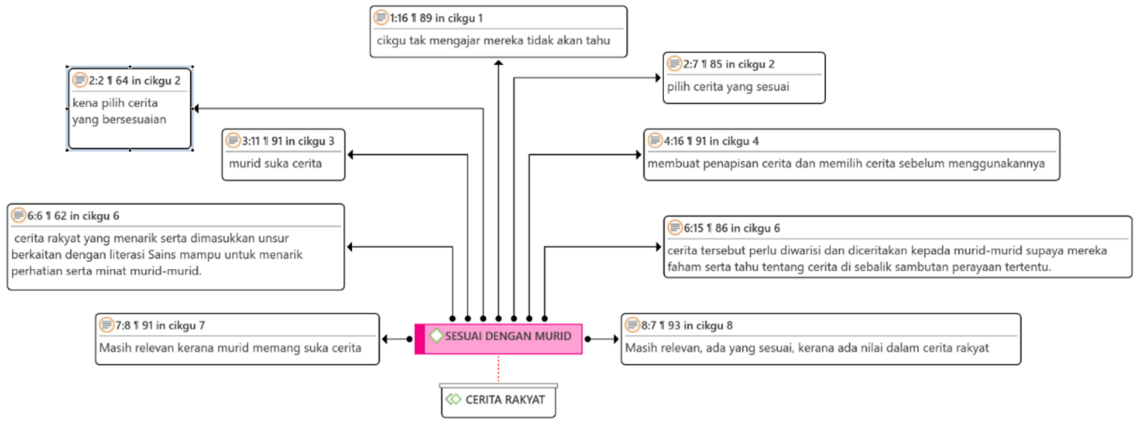

Figure 5. Suitable for Students

6.2.2.2 Learning Stimulation

Based on the interview, the learning stimulus is that students regardless of race like to listen and are interested in stories, students can learn something about the story can attract interest with attention, students have fun and follow what is taught, it is easier for students to understand what is actually happening, interesting students' attention in class, students will be more active, they will involve themselves and understand science more easily, interesting folk stories and the inclusion of elements related to science literacy can attract students' attention and interest and the stories need to be passed down and told to students so that they understand and know the story behind the festival. Figure 6 shows the sub-theme of Folklore which is learning stimulation.

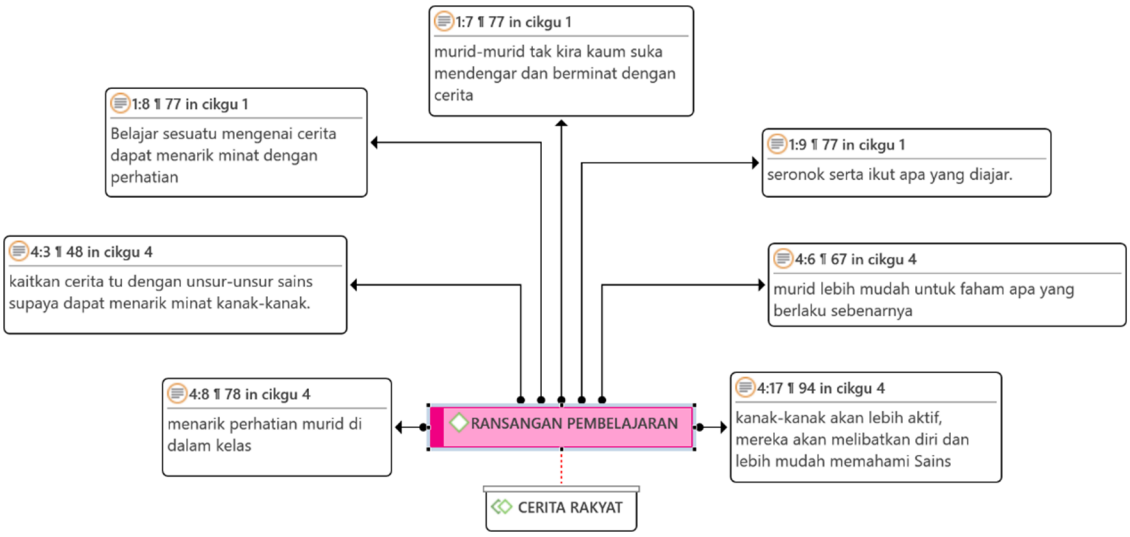

Figure 6. Learning Stimulation

6.2.2.3 Natural Story

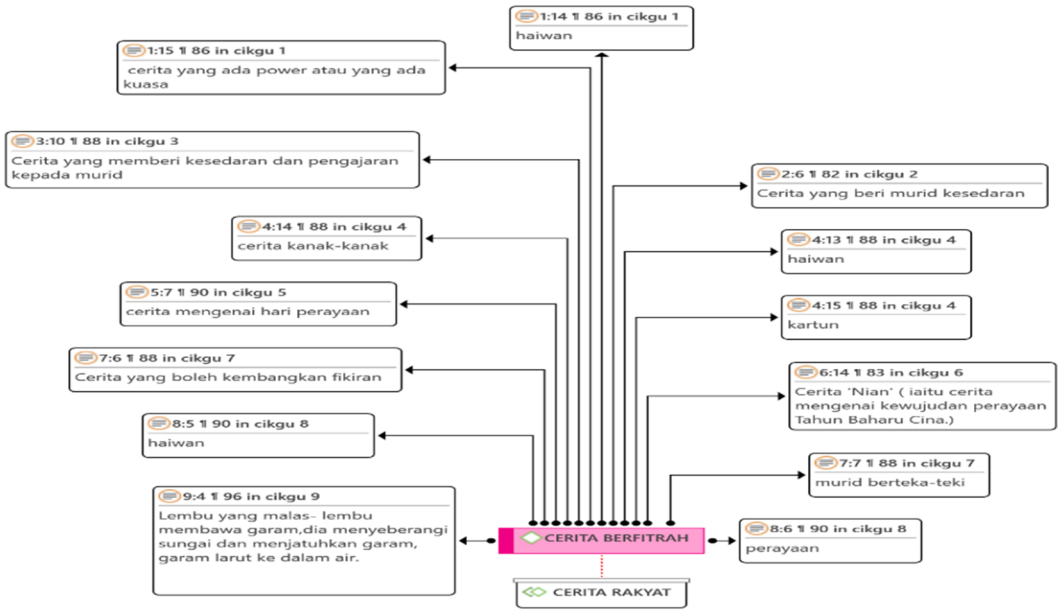

Figure 7. Natural Story

Natural story is a sub-theme of folklore. The contents that found in natural stories based on interviews with SJKC preschool teachers are animals, stories that have power (students' imaginations), stories that bring awareness, stories with cartoon elements, stories about festivals, for example the *'Nian'* story (that is, a story about the existence Chinese New Year celebration), a story that can develop the mind and students can puzzle and finally an example of a story related to animals which is the story of the lazy cow which is a cow that carries salt and crosses the river, it drops salt into the river, then the salt dissolves. Figure 7 shows the sub-theme of Folklore which is natural story.

6.2.3 Dialogic Reading Techniques

6.2.3.1 The Teacher's Understanding of Dialogic Reading Techniques

The content of the teacher's understanding in the dialogic reading technique is that students can learn easily and systematically, students can listen and repeat what they get, this technique allows students to talk a lot, this technique involves the teacher's activity of reading stories to students while interacting with students, students can understanding the context of the story and telling it can attract students' interest and curiosity, students will participate more actively because this dialogic reading involves communication between two parties as well as a story, this technique allows students to ask questions related to the story they read together and finally students can acquire new knowledge and sharpen their minds to think critically and creatively. Figure 8 shows the sub-theme for dialogic reading techniques, which is the teacher's understanding of dialogic reading techniques.

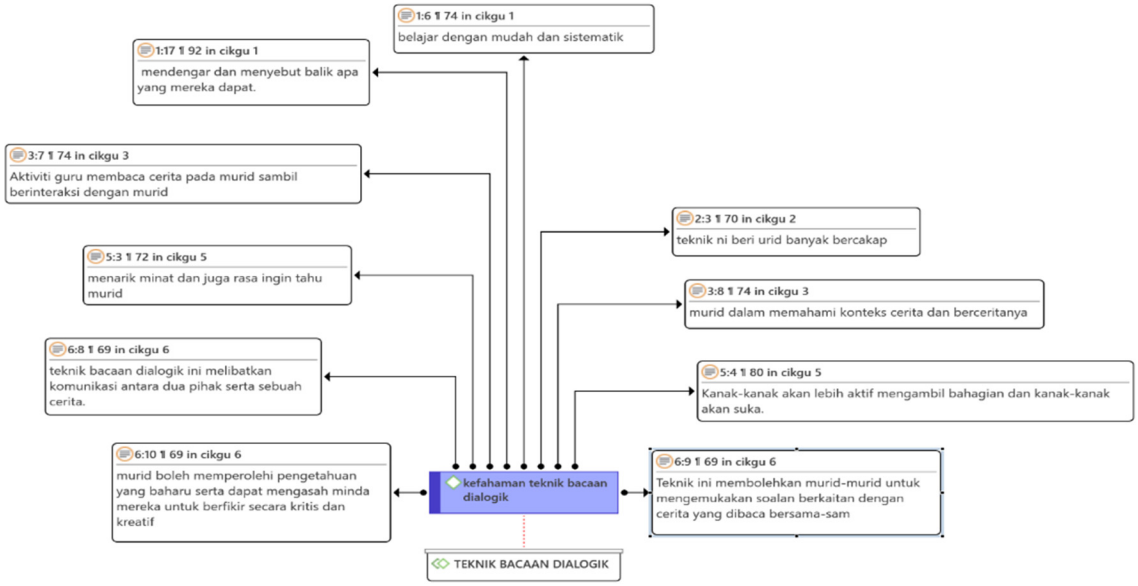

Figure 8. The Teacher's Understanding of Dialogic Reading Techniques

6.2.4 Model Requirements

6.2.4.1 Need of an Interactive Science Literacy Model Based On Folk Stories for Chinese Children Using Dialogic Reading Techniques

Based on the interviews that have been conducted, 9 out of 9 preschool teachers need a teaching model in teaching Science Literacy. The content of the interview is the teacher giving the opinion that they can use the model to teach Science Literacy, can apply it in science literacy and Chinese Folktales well, the model will facilitate the work of the teacher to find information can help me but not burden and give support to the teacher, has the potential to improve students' understanding and ability to apply science knowledge in life, the application of this technique depends on the ability of an educator to produce a story that is consistent with the topic in science literacy and finally this model can be a new technique to improve students' understanding of the applied topic. Figure 9 shows the sub theme of the model which is the model's requirements.

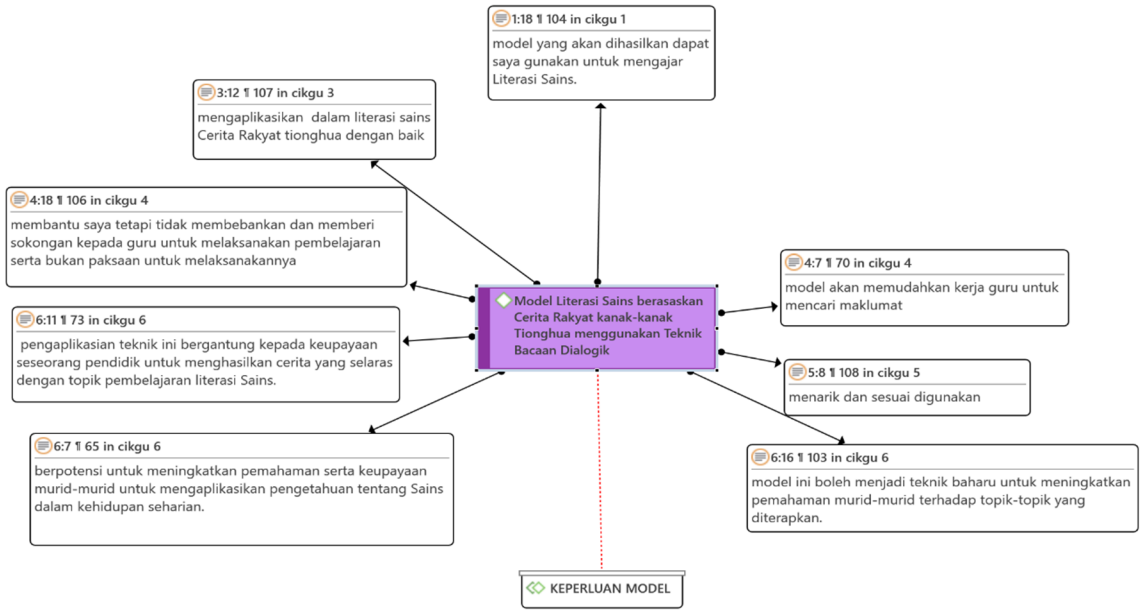

Figure 9. I. Need of an Interactive Science Literacy Model Based on Folk Stories for Chinese Children Using Dialogic Reading Techniques

6.3 Questionnaire

Teacher's needs for the model of dialogic reading techniques through stories are divided into 3 sections namely which are the level of preschool teachers' knowledge about reading techniques dialogic, the skill level of preschool teachers regarding reading techniques dialogic and the construction requirements of a dialogic reading technique module through Children's folklore is constructed in Preschool SJK(C).

6.3.1 The Level of Preschool Teachers' Knowledge about Reading Techniques Dialogic

Preschool teachers' level of knowledge about reading techniques Dialogic can be seen through the calculation of mean, frequency and standard deviation. The findings of the study and the order of the teacher's level of knowledge about reading techniques dialogic is seen through three levels which are low, medium and high based on the mean score found in the table 5.

Table 5. Mean Score of Teachers' Level of Knowledge about Dialogic Reading Techniques

Min Score	Frequency	Percentage (%)	Level
<2.33	0	0	Low
2.331-3.66	7	8.1	Medium
>3.66	79	91.9	High

Table 5 shows the mean distribution for the level of teacher knowledge preschool about dialogic reading techniques. The numbers show a total of 11 teachers (12.8%) have a low level on the knowledge of dialogic reading techniques and 62 teachers (72.1%) also has a moderate level of knowledge of reading techniques dialogic. Only 13 teachers (15.1%) have a degree knowledge of high dialogic reading techniques. Basically, overall level of teacher knowledge about dialogic reading techniques is at a low level (Min =2.02, SD = 0.530).

6.3.2 The Skill Level of Preschool Teachers Regarding Reading Techniques Dialogic

Table 6 shows the mean distribution of teacher skill levels about dialogic reading techniques. The number shows a total of 10 Preschool students (11.6%) have a low level in the skill level of preschool teachers regarding dialogic reading techniques while a total of 67 preschool teachers (77.9%) have a moderate level of skill in reading techniques dialogic. Only 9 teachers are skilled in implementing material techniques dialogic reading which (10.5%) has a high level of dialogic reading technique. Overall the level of teacher skills about dialogic reading techniques is at a low level (Mean=1.99, SD=0.473).

Table 6. Mean Score of Teachers' Skill Level of Regarding Reading Techniques Dialogic

Min Score	Frequency	Percentage (%)	Level
<2.33	10	11.6	Low
2.331-3.66	67	77.9	Medium
>3.66	9	10.5	High

6.3.3 The Development Requirements of a Dialogic Reading Technique Model through Children's Folklore is Development in Preschool SJK(C)

Table 7 shows the mean distribution of the level of need development of a dialogic reading technique module through folk tales. Number showing a total of 79 preschool teachers (91.9%) have the need for the construction of a dialogic reading module through folk tales on high level while only 7 preschool teachers namely (8.1%) have a moderate level of module construction requirements dialogic reading through folklore. Overall level the need for the development of a dialogic reading module through folk tales is at a high level (Mean=4.25, SP=0.461).

Table 7. The Development Requirements of a Dialogic Reading Technique Model through Children's Folklore is Development in Preschool SJK(C)

Min Score	Frequency	Percentage (%)	Level
<2.33	11	12.8	Low
2.331-3.66	62	72.1	Medium
>3.66	13	15.1	High

7. Discussion

Overall, the researcher thinks that this research question has been answered through the needs analysis conducted. The researcher interviewed 9 SJKC preschool teachers and 86 preschool teachers have answered the questionnaire that has been distributed. All SJKC preschool teachers have given a positive response to the researcher regarding the construction of this model.

It is critical to obtain information about the built model that can assist teachers. The researcher concluded that The Development Of An Interactive Science Literacy Model Based On Chinese Children's Folk Stories Using Dialogic Reading Techniques Among SJKC Preschool Students is required in teachers' teaching based on the findings of this study. This is due to the fact that understanding the concept of Science is critical in teaching. An interesting and creative approach or method can pique children's interest in using books as a learning medium. Teachers should find a way to engage Chinese students in reading so that they are interested and focused on learning to read in Malay. An interactive teaching method can pique students' interest in learning to read. Delivery techniques are heavily emphasized in order to ensure that students develop understanding and mastery of the language as well as the desired achievement at the highest level (Aishah Abdul Malek et al., 2019). With this, the researcher is confident that this model can guide preschool teachers to teach Science Literacy. This is because the needs analysis shows that preschool teachers are not yet proficient in the use of dialogic techniques in teaching science

Following that, a student's mastery of a skill is determined by the teaching technique employed (Jamian and Baharom (2018). As a result, teachers play an important role in employing appropriate, effective teaching techniques, and students' ability to maintain attention to Malay language learning can indirectly improve their science literacy skills. According to Abdul et al., (2019), the teacher's teaching method has a significant impact on the emotional development of children who are able to shape the character of their self-image. There are various approaches and techniques that teachers can use to improve the development and mastery of SJK (C) preschool students' reading skills, and researchers intend to build a model of dialogic reading techniques through stories to attract and motivate students and improve their reading skills. Based on the needs analysis, it was found that none of these preschool teachers have ever used dialogic reading techniques in teaching Science Literacy. Therefore, the researcher will build this model to give reference to teachers to teach.

Furthermore, using a story-based approach can increase children's curiosity and improve their Science Literacy. Language skills develop in preschool students as a result of their curiosity, and they can ask questions based on their language skills (Amelia, 2021). However, studies on children's picture story books have received less attention in Malaysia. 2021) (Arumugam et al., 2021). Students will show interest and attention to the storytelling session if the storyteller shows interesting material (Aishah Abdul Malek et al., 2019). Concrete materials are things that students

can physically see. As a result, researchers will create an interactive model of Science Literacy with interesting elements to address the issue of preschool students failing to master Science Literacy reading skills. For children who are good at reading Science Literacy, this storytelling-based approach can directly form understanding and Science Literacy skills.

Finally, using dialogic reading techniques, researchers will create an interactive model of Science Literacy based on Chinese children's stories. The practice of reading interactive picture books to children in order to improve their language and early literacy skills is known as dialogic reading. So, Adults and students will switch roles while reading using this dialogic reading technique so that children can learn to be storytellers with the assistance of adults who act as active listeners and questioners. According to Farah R et al. (2019), a process in the dialogic reading technique is asking open-ended questions about the story, developing children's answers by repeating them, clarifying questions or asking further questions, and giving praise and encouragement to students to provide input to the story. Based on the findings of the study, there are still many SJKC preschool teachers who do not know how to use dialogic techniques in their learning. With this, the researcher has included learning using dialogic techniques in this model.

8. Conclusion

Overall, this study was conducted to analyze the needs of the Interactive Model of Science Literacy based on Chinese children's folktales using dialogic reading techniques among students. After obtaining an analysis of the needs of this model, the next step of the researcher will begin to design and develop an Interactive Science Literacy Model based on Chinese children's folktales using dialogic reading techniques among SJKC preschool students.

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Authors contributions

Dr. Romarzila Omar were responsible for study design, data collection and revising. She was a leader for this research. Lina Busyra Shafwan, Dr. Ruslan Abdullah and Mr. Hazhari Ismail was responsible for data collection. Dr. Seah Siok Peh, Nur Ain Farhana Kariuddin and Dr. Adibah Abu Bakar was responsible for data analysis. All authors read and approved the final manuscript. All authors contributed according to their respective expertise. The leader of researcher, Dr Romarzila, has expertise in STEM education for young children. Lina Busyra Shafwan, Dr. Ruslan and Mr. Hazhari Ismail was expertised in developing instruments for data collection. Dr. Seah Siok Peh, Nur Ain Farhana Kariuddin and Dr. Adibah Abu Bakar expertise in analyzing qualitative data.

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